CROSS-CULTURAL VARIATIONS IN

PERCEIVED CONTROL AND ANXIETY

A Thesis Presented to the
Faculty of the College of Education
University of Houston

In Partial Fulfillment
of the Requirements for the Degree

Master of Education

by

Alexandria Marisol Posada

August 2014

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Abstract

Anxiety affects millions of adults in the United States. A variety of models have been proposed that describe subtypes of anxiety as well as causes and effects of anxiety. Perceived control has been identified as an important component of some of these anxiety models (e.g. Chorpita & Barlow, 1998). These models include different interpretations and conceptualizations of anxiety and of perceived control. Consequently, there are a variety of operational definitions and measures for both anxiety and perceived control. However, there is limited research that investigates the validity of the measures and the structural relationships between these constructs, especially across different populations. The purpose of this study was to evaluate the measurement and structural invariance of anxiety and perceived control across three adult populations: African Americans, Caucasians, and Hispanics/Latinos. Participants were 210 students from a large, ethnically diverse, urban University. Forty-four participants identified as African American, 67 as Caucasians, and 99 as Hispanic/Latino. Multi-group structural equation modeling (SEM) was used to evaluate measurement and structural models relating perceived control to anxiety. Strict measurement invariance was established in both the anxiety and perceived control models. Additionally, factor variances were invariant across the three groups. However, the structural relationships between the latent factors as well as the latent means were not invariant across groups. Hispanic/Latinos had a

significantly higher correlation between the DASS (somatic and arousal symptoms of anxiety) and the SOC (personal and interpersonal control) than African Americans and Caucasians. Hispanic/Latinos also reported higher levels of perceived personal control than African Americans and Caucasians.

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Chapter I

Introduction

Anxiety is a sense of nervousness and irrational fear of the impending future or situations, which can be accompanied by physical symptoms. According to the Anxiety and Depression Association of America (ADAA, 2013) clinical levels of anxiety affect 40 million adults in the United States. Clinical anxiety (i.e. an anxiety disorder) is an excessively high level of anxiety that is chronic and adversely affects people's daily lives for most of their lives. Clinical anxiety encompasses disorders such as panic disorder, specific phobias, and post-traumatic stress disorder; these disorders can have debilitating effects such as avoidant behaviors, violent outbursts, and depression. While 18% of the United States adult population is affected by an anxiety disorder, most adults do not have these clinical levels of anxiety (ADAA, 2013). However, non-clinical anxiety is important to understand because it can have both positive and negative effects depending on the level of anxiety and the individual. For example, low amounts of anxiety are related to better academic achievement, and high amounts of anxiety are related to poor academic performance (Chapell et al., 2005; Putwain, 2013; Seipp, 1990).

There are a variety of questions about anxiety that need to be answered. Although research has addressed many of them to some extent, there are still gaps in the literature. One set of questions relates to the measurement of anxiety. There are a variety of existing instruments that are used to measure anxiety such as the Beck Anxiety Inventory (BAI; Beck & Steer, 1990), Depression Anxiety Stress Scale (DASS; Lovibond & Lovibond), State-Trait Anxiety Inventory (STAI; Spielberger et al., 1983), Hamilton Anxiety Rating Scale (HARS; Hamilton, 1959), and the Hospital Anxiety and Depression

Scale (HADS; Zigmond & Snaith, 1983) to list a few (Antony, Orsillo, & Roemer, 2001). One question regarding these measures is how they relate to one another. Depending on what measures are used, it can lead to different results. A second question related to measurement is about the validity of these anxiety scales across different populations, and whether the psychometric properties differ across populations. A third question related to measurement is evaluating cutoff values for anxiety scales between clinical and non-clinical anxiety levels.

A second set of questions relates to causes and effects of anxiety. A variety of models exist identifying different causes and effects of anxiety (Chorpita & Barlow, 1998; Muris, 2006). For example, Muris (2006) identifies several protective and risk factors for childhood anxiety including genetics, behavioral inhibition, and perceived control. In particular, perceived control is a protective factor in that the greater amount of perceived control a child has the less likely he or she is to develop an anxiety disorder. Similar to anxiety, there are questions related to measurement of perceived control and the validity of the measures as well as the relation between perceived control and anxiety across populations. Although perceived control has been identified or evaluated as a potential cause of anxiety in several studies (Chorpita & Barlow, 1998; Muris, 2006; Peterson, Klein, Donnelly, & Renk, 2009), they do not address the measurement issues described above.

This study focused on questions related to the measurement of anxiety and perceived control, specifically the invariance of measures of these constructs across populations of typical adults. A second goal of the study was to evaluate the structural relationship between anxiety and perceived control across populations.

Theoretical Framework

There are several theories that attempt to explain the origins of anxiety within different frameworks including psychoanalytical, behavioral, cognitive, and physiological (Strongman, 1995). The perspective guiding this study is an integrated model illustrated by Chorpita and Barlow (1998). Chorpita and Barlow (1998) suggest that "early experiences with reduced control can foster a psychological diathesis that may eventually give rise to increased anxiety (and perhaps depression) in children and adults" (p.3). They outline a model that incorporates multiple perspectives including cognitive, emotional, information processing, and physiological. In a child's early development, he or she may experience an instance with uncontrollable stimuli, which leads to their low perceived control in that situation. What follows is increased inhibition and somatic outputs such as increased heart rate. Combined, these processes affect later development along various pathways. The two pathways that frame this study involve cognitive processes and biological effects.

The first pathway is the cognitive processing of information related to initial low perceived control. This information is stored in memory becoming resistant to change from new experiences over time. Thus, an individual may make biased decisions about the controllability of a situation based on stored information from prior experiences. This may later be translated to misinterpretations of situations as uncontrollable when presented with control-ambiguous stimuli. The second pathway is the biological effects of low perceived control on the behavioral inhibition system (BIS). Over time, experiences with low control can lead to high levels of cortisol, the stress hormone. High levels of cortisol activate the BIS causing sensitivity to non-rewarding, punishing, and

new situations resulting in the individual being more avoidant of these situations that might bring about anxiety, fear, or frustration.

The Chorpita and Barlow (1998) model fits with the theory that anxiety can be manifested in two ways: state and trait anxiety (Spielberger et al., 1983). The concepts of state and trait anxiety were initially introduced by Cattell (1966) and Cattell and Scheier (1961, 1963) and then further expanded upon by Spielberger and colleagues (1966, 1972, 1979; Spielberger & Diaz-Guerrero 1976). Trait anxiety is a stable proneness to experience anxiety whereas state anxiety, while influenced by the general trait level, fluctuates with the specific situation such as anxiety related to test taking.

Chorpita and Barlow (1998) suggest that a sense of control may "contribute to something of a psychological template, [that then]… becomes relatively fixed" (p. 16), which suggests a manifestation of trait anxiety. In addition, a sense of control could also be "a mediator between stressful experience and anxiety and over time… [it can] become a somewhat stable moderator of the expression of anxiety" (p. 16), which suggests state anxiety triggered by certain situations in which there is less of a sense of control.

Measures of Anxiety. Within the contexts of the Chorpita and Barlow (1998) model and the subtypes of anxiety described by Spielberger et al. (1983), anxiety may be expressed in a variety of ways in terms of cognitive processes (i.e. I worry too much), somatic symptoms (i.e. feelings of tension), and physiological responses (i.e. breathing difficulty). Thus, different instruments use different combinations of observable factors to measure anxiety depending on the definition guiding survey development. A variety of instruments have been developed to reflect these different manifestations of anxiety, including the instruments evaluated in this study: Beck and Steer's (1990) Beck Anxiety

Inventory (BAI), Lovibond and Lovibond's (1995) Depression Anxiety and Stress Scale, and Spielberger et al.'s (1983) State Trait Anxiety Inventory (STAI).

For example, the BAI measures anxiety by having individuals endorse statements related to cognitive processes and somatic symptoms. The BAI can ask "in the past month (or week) have you been bothered by: inability to relax, feeling shaky or terrified". According to Creamer, Foran, and Bell (1995), when compared to the STAI, the BAI appears to be functioning as a measure of state anxiety. Since the BAI is meant to discriminate from depression it heavily relies on somatic and panic symptoms of anxiety for the items content instead of more general stress-related anxiety symptoms (Cox, Cohen, Direnfeld, & Swinson, 1996). On the other hand, STAI has a subscale for state and a subscale for trait anxiety. Both subscales measure anxiety by having people rate cognitive and somatic symptoms. The state subscale asks respondents to answer based on their present feelings, which reflects state anxiety. The trait subscale asks respondents to answer based on how they generally feel, which indicates trait anxiety. While comprised of categorically similar items (i.e. somatic and cognitive), the differences between these measures of anxiety could lead to differences in results.

The anxiety measures to be used in this study have demonstrated good psychometric properties in college students (Creamer, Foran, & Bell, 1996; Norton, 2007; Osman, Wong, Bagge, Freedenthal, Gutierrez, & Lozano, 2012; Lovibond & Lovibond, 1995; Spielberger et al., 1983) such as high internal consistency. For example, the subscales of the DASS-21 demonstrated high internal consistency for the entire sample (depression: $\alpha = .829$, anxiety: $\alpha = 778$, stress: $\alpha = .871$, Norton, 2007). Creamer, Foran, and Bell (1995) found the BAI has demonstrated strong internal consistency in

nonclinical college populations (αs = .91, 90). According Spielberger's (1983) State Trait Anxiety Inventory (STAI) manual the STAI has also demonstrated high internal consistency in college students for both males (α = .90) and females (α = .91). These measures are also moderately correlated also highly correlated with one another demonstrating validity (Osman et al., 2012; Creamer et al., 1995; Spielberger et al., 1983). The Depression Anxiety Stress Scale (DASS-21) has also shown good concurrent validity with the BAI (r = .69, p<.001, Osman et al., 2012). Additionally, while the BAI is a highly discriminant measure of anxiety, this affects the convergent and construct validity. The BAI has low convergent validity with both the state and trait subscales of the STAI (Creamer, Foran, & Bell, 1995).

However, these measures have primarily been evaluated among specific populations such as predominately Caucasian populations. There is limited research establishing the invariance of these measures across different populations (e.g. African American, Hispanic). Norton (2007) found that for the DASS-21 the item loadings were invariant across four racial groups (African Americans, Asian Americans, Caucasians, and Hispanic/Latinos) finding metric invariance. In all, these three measures have not been evaluated together. More cross-cultural research is needed to explore the invariance of these anxiety measures across populations.

Perceived Control. Perceived control is an important component of the Chorpita and Barlow (1998) model in that experiences with perceived lack of control in the early environment can lead to the development of anxiety. Perceived control is the belief or perception of one's own control over his or her actions or outcomes (Chorpita & Barlow, 1998; Rotter, 1966). Low perceived control is considered a vulnerability factor for

anxiety whereas high perceived control is considered a protective factor against developing anxiety, at least among children (Muris, 2006). Perceived control has also been an important part of anxiety models as a moderator of the relationship between other variables such as anxiety sensitivity and agoraphobia in adults (White et al., 2006).

In some cases, perceived control is defined in a domain specific way, and in other cases it is defined in a domain general way. Examples of domain specific definitions include control over one's thoughts, control over academic outcomes, or control over emotions and situations (Peterson et al., 2009; Ruthig et al., 2006; White et al., 2006). For example, the Anxiety Control Questionnaire (ACQ, Rapee et al., 1996) measures perceived control over emotional reactions and external threats. It asks specific questions regarding control over stress, emotions, and coping with difficult situations.

Examples of domain general measures of perceived control include Rotter's (1966) Internal-External Locus of Control (LOC) scale and Paulhus' (1990) Spheres of Control Scale (SOC-30). Rotter's LOC scale (1996) assumes that perceived control is a one-dimensional construct that measures one's general sense of control as either within one's self (i.e. internal) or outside of one's self (i.e. external). It asks respondents to choose between two choices and select the one they agree with most. One choice represents an external locus of control and the other choice represents and internal locus of control. Paulhus and Van Selst's SOC-3 (1990) asks the level of agreement with a series of statements revolving around three general dimensions of perceived control (e.g. personal, interpersonal and socio-political).

These different definitions of perceived control can lead to different ways of measuring the construct, and these different measures may be related to anxiety in

different ways. Domain specific perceived control definitions would be more likely used in a study of state anxiety over a specific situation such as control over illness related to anxiety before and after surgery (Gallagher & McKinley, 2009). Domain general definitions might be more useful in studies measuring general trait anxiety.

The focus of this study is on both domain general and domain specific measures of perceived control. The domain general measures (e.g., Rotter's LOC scale and the Spheres of Control Scale) and the domain specific measure (e.g., Anxiety Control Questionnaire) of perceived control described above have demonstrated good psychometric properties such as discriminant, convergent, and predictive validity (Rapee et al., 1996; Paulhus & Van Selst, 1990; White et al., 2006). The ACQ has demonstrated good convergent and discriminant validity (Rapee et al., 1996). The ACQ has been used in conjunction with measures of anxiety to determine different types of validity (Rapee et al., 1996; White et al., 2006). The ACQ was to found to be a better predictor of anxiety, measured by the DASS anxiety subscale, than another measure of perceived control, Rotter's (1966) LOC scale; when computing differences between correlations, Rapee et al. (1996) found that the ACQ significantly correlated stronger with the DASS-Anxiety than did the LOC ($t(68) = 1.92$, $p < .05$). Paulhus and Van Selst's (1990) Spheres of Control Scale (SOC-3) has demonstrated some validity with Rotter's (1996) LOC scale. The subscales of personal, interpersonal, and sociopolitical control have demonstrated concurrent validity with the Rotter's Locus of Scale ($r = -.37, -.28, -.50$, respectively) in that those that report more perceived control also report having more of a sense of internal locus of control. More research is needed to explore the relations between all these measures and their validity across groups.

The evidence described above suggests these different measures have good psychometric properties. However, across measures it is unclear whether they are measuring different dimensions of perceived control or entirely different constructs. In addition, there is a lack of information on the psychometric properties across populations. Finally, it is not clear if the structural relationship between perceived control and anxiety is invariant across populations.

Cultural Variations. One aspect of anxiety that is not typically addressed in theoretical models of anxiety is how culture may influence the processes involved in the development and manifestation of anxiety. Culture may influence the measurement of anxiety and constructs related to anxiety. Although not explicitly addressed by theories of anxiety, there has been some limited empirical work evaluating the effects of culture on levels of anxiety, measurement of anxiety, and relations between anxiety and associated constructs such as perceived control (Baloğlu, Abbasi, & Masten, 2007; Chapman, Williams, Mast, & Woodruff-Borden, 2009; Norton, 2005; Norton, 2007; Whisman, Judd, Whiteford, & Gelhorn, 2012).

The evidence suggests that levels of anxiety may differ across populations (Baloğlu et al., 2007; Chapman, Williams, et al., 2009). In a study of college students, Baloğlu et al. (2007) found that Mexican students reported higher levels of anxiety than American students. Furthermore, Chapman, Williams et al. (2009) found that African Americans and European Americans differed in their reported anxiety levels with European Americans reporting a higher level of anxiety using the Beck Anxiety Inventory (BAI). Additionally, the evidence suggests that levels of perceived control may differ across populations (Chapman, Kertz et al., 2009). Chapman, Kertz et al.

(2009) found that European Americans had a significantly lower mean level of perceived control than African Americans.

However, interpreting what the different levels mean may be problematic if what is being measured differs across populations. For example, Varela and Hensley-Maloney (2009) conducted a study among Latino children in an attempt to unveil cultural influences on anxiety. This study suggests that in Latino culture mental illness carries a social stigma which can lead to the usage of benign terminology (e.g., ataque de nervios, literally, "attack of nerves") to describe feelings of distress (Varela & Hensley-Maloney, 2009). Differences in expression of anxiety have been found between Latino children and European American children in terms of somatic (i.e. physical) symptoms of anxiety and worry symptoms, but not other expressions of anxiety such as separation or panic (Varela & Hensley-Maloney, 2009). It has been suggested that because anxiety symptoms represent a social stigma, Latino children are encouraged to be pleasant even in contexts that may be anxiety provoking. Consequently, they might be disinclined to disturb their parents with emotional issues. This then can translate to the internalization of anxiety and result in over reported somatic symptoms (Varela & Hensley-Maloney, 2009).

Measurement. Some studies have looked at the invariance of anxiety measures. Chapman, Williams, et al. (2009) evaluated the measurement properties of the Beck Anxiety Inventory (BAI) among African Americans and European Americans. The study conducted a factor analysis of the BAI and found that previous factor solutions were not the best fit for either African Americans or European Americans in the study. An alternative two-factor solution was provided that was a better fit for both groups. The

authors do not explicitly address the invariance of the factor solution though. It is unclear if the two factor solution was invariant across the two populations.

Norton (2007) evaluated the Depression, Anxiety, and Stress Scale (DASS-21) across four racial groups (African American/Black, Caucasian/White, Hispanic/Latino, and Asian). Norton (2007) found configural (i.e., factor structure) and metric (i.e., loadings) invariance across the four racial groups. However, the covariances between the constructs of depression, anxiety, and stress were not invariant across groups. In a study of depression, a mood disorder related to anxiety, Whisman (2012) used the Beck Depression Inventory (BDI) and found factorial invariance across gender, race, and ethnicity (Whites, Blacks, Latinos, Asians, and other). Overall, these measures have been found to be invariant. That is, they represent the same construct across cultural groups.

Chapman, Kertz et al. (2009) examined the relationship between perceived control, psychological distress, and worry. Configural invariance was found for both measures of psychological distress and perceived control across African Americans and European Americans.

However, these studies have not addressed the measurement invariance for multiple measures across cultural groups. For example, each of these studies examined a single measure of anxiety and did not evaluate multiple measures of anxiety at one time. By evaluating multiple measures, the relations between the measures can be evaluated across different populations. In addition, no study has examined the measurement invariance of perceived control using multiple measures across these groups.

Structural. Norton (2007) also evaluated the relationship between depression, anxiety, and stress across four racial groups. Norton (2007) found that there were

differences in the way the constructs related to each other across the different groups. The correlation coefficients between depression, anxiety and stress were the strongest among African Americans (rs = .93, .92, .97) followed by Hispanic/Latinos (rs = .79, .85, .84) and then Caucasians (rs = .71, .72, .80). More research is needed to investigate and expand on these differences

In their study of the relationship between perceived control, psychological distress, and worry, Chapman, Kertz, et al. (2009) found that for African Americans, psychological distress was the better predictor of worry as opposed to perceived control. Conversely, for Europeans Americans, low perceived control contributed more to worry.

Both of these studies focused on single measures to represent anxiety or a single measure to represent perceived control. No previous study has demonstrated invariance of multiple measures of perceived control and anxiety. Furthermore, no previous study has evaluated the structural relationship between perceived control and anxiety across cultural groups using multiple measures.

Chapter II

Study Rationale and Hypotheses

Study Rationale

Anxiety and perceived control are measured in a variety of ways depending on the theoretical model and context. However, there is limited research evaluating the psychometric properties of these measures, whether they all represent the same or different constructs, and whether there is variation across populations in their measurement properties or the relations between the constructs. The goal of the current study is to address some of these issues.

The current study is focused on three adult populations: African Americans, Caucasians, and Hispanic/Latinos. Three measures for each construct were evaluated to determine if these measures represent the same constructs across the three populations. The anxiety measures included Beck and Steer's (1990) Beck Anxiety Inventory (BAI), Lovibond and Lovibond's (1995) Depression Anxiety and Stress Scale short form (DASS-21), and Spielberger et al.'s (1983) State Trait Anxiety Inventory (STAI). These three measures of anxiety are widely utilized to assess anxiety. These measures have been evaluated in different studies of anxiety (Baloğlu et al., 2007; Chapman, Williams, et al., 2009; Chapman, Kertz, et al., 2009; Norton, 2005; Norton, 2007; Osman et al., 2012) but have not been evaluated together in one study.

The perceived control measures included: Rapee et al.'s (1996) Anxiety Control Questionnaire (ACQ), Rotter's (1966) Internal External Locus of Control Scale, and Paulhus and Van Selst's (1990) Spheres of Control-3 (SOC-3) scale. These measures of perceived control have not been used together in one study before.

Measurement invariance of anxiety and perceived control was evaluated separately across the three adult populations. The structural relationship between anxiety and perceived control was then evaluated across groups.

Hypotheses

Based on previous literature demonstrating invariance in a variety of anxiety related instruments (Norton, 2005; Norton, 2007; Whisman et al., 2012), it was hypothesized that measures anxiety and measures of perceived control would be invariant across groups. Based on the literature suggesting differences in the structural relationship between anxiety and other constructs (e.g., Norton, 2007), it was hypothesized that the structural relationship between anxiety and perceived control would be different across groups.

There was conflicting information as to the order of magnitude across populations. Norton (2007) found that African Americans had the strongest correlations between anxiety and other constructs (rs = .93, .92, .97) followed by Hispanic/Latinos (rs = .78, .85, .84) and Caucasians (rs = .71, .72, .71) respectively. However, Chapman, Kertz, et al., (2009) found higher correlations between worry and perceived control among European Americans than among African Americans. Differences could be due to the measures used in each study. Therefore, although the relations between anxiety and perceived control are expected to differ across populations, it was not clear what the direction of those differences would be.

Chapter III

Methods

Participants

Participants in this study consisted of 210 students (174 females). Participants were between the ages of 18 and 50 (mean = 23.05, SD = 4.78). Forty-four participants identified as African American, 67 identified as Caucasians, and 99 identified as Hispanic/Latino (See Table 1 for more demographic information). The participants were recruited from a large, ethnically diverse, urban university, through their classes (Appendix A), through flyers (Appendix B) and the psychology SONA website. For their participation, students were eligible to receive 1 hour of SONA extra credit and eligible to be entered into a $25 VISA gift card drawing.

Table 1.

Participants Demographics by Group

Demographic	African Americans	Caucasians	Hispanic/Latinos
	(n = 44)	(n = 67)	(n = 99)
Mean age (SD)	22.11 (3.77)	23.36 (6.11)	23.26 (4.09)
Age range	18-40	18-50	18-38
Gender		Percent	
Female	81.8	76.1	87.9

Measures

Demographics. The demographic survey used (Appendix C) included questions about participants' gender, age, major, and race/ethnicity.

Anxiety. Anxiety was measured using three scales: Beck Anxiety Inventory (BAI), Depression Anxiety and Stress Scale (DASS-21), State Trait Anxiety Inventory (STAI).

Beck and Steer's (1990) Beck Anxiety Inventory (BAI) is a screening tool for anxiety (Appendix D). It lists common symptoms and asks the participant to rate on a 4-point scale (0-3) how bothered they are by the symptom listed (not at all, mildly, moderately, and severely). The BAI has demonstrated good internal consistency for both Caucasians and Latinos ($\alpha = .89$) (Contreras et al., 2004). Contreras suggests that factors load similarly for both groups, further suggesting that these items tap into the same constructs for Caucasians and Latinos. There has been little psychometric research data for African Americans on the Beck Anxiety Inventory. Chapman, Williams, et al. (2009) suggests that the original two-factor loading is insufficient for both African Americans and European Americans. In their study, they offer an alternative two-factor loading of the Beck Anxiety Inventory (Chapman, Williams et al., 2009). Raw scores based on summing item responses for each subscale were used in all analyses. The subscales for the BAI are based on a two factor structure derived in previous research (Hewitt & Norton, 1993). For the full BAI, scores can range from 0-63. Scores may range from 0 - 36 for the Somatic subscale and from 0 to 27 for the Subjective subscale. However, due to a data collection error scores on the Somatic subscale are based on 11 out of the 12 items so scores ranged from 0 to 33.

Lovibond and Lovibond's (1995) Depression Anxiety and Stress Scale short form (DASS-21) is a 21-item list of statements (Appendix E). The scale asks participants to rate on a 4-point scale (0-3) how well each statement applies to them (never, sometimes,

often, almost always). The DASS-21's depression, anxiety, and stress subscales have shown good reliability among college undergraduates with $\alpha = .85, .81, .88$, respectively (Osman, Wong, Bagge, Freedenthal, Gutierrez, & Lozano, 2012). The DASS-21 also showed good concurrent validity when compared to other established measures of depression, anxiety, and stress. For example, the DASS-21 total score was also highly correlated with the Beck Anxiety inventory ($r = .69$, $p<.001$). The DASS-21 is scored on a 4-point Likert scale (0-3). Raw scores based on summing item responses for two of the DASS-21's subscales (Anxiety and Stress) were used in all analyses. Scores may range from 0-21 for the Anxiety subscale and from 0-21 for the Stress subscale.

Spielberger et al.'s (1983) State Trait Anxiety Inventory (STAI) is a self-report measure that consists of 40 items measuring current state anxiety and persistent trait anxiety (Appendix F). The state subscale contains statements such as "I feel calm" and "I feel nervous". It is measured on a four point Likert-type scale on well it describes the individuals present feelings (not at all, somewhat, moderately so, very much so). The trait subscale contains items such as "I feel like a failure" and "I make decisions easily". It is measured on a four point Likert-type scale on well it describes how the individual generally feels about themselves (almost never, sometimes, often, almost always). The STAI has demonstrated high internal consistency in college students for both males ($\alpha = .90$) and females ($\alpha = .91$). According Spielberger's (1983) State Trait Anxiety Inventory (STAI) manual has demonstrated good concurrent validity with other measures of trait anxiety such as the IPAT Anxiety Scale (Cattell & Schieier, 1963). Raw scores based on summing item responses for each subscale were used in all analyses. Scores may range from 20-80 for the State subscale and from 20-80 for the Trait subscale.

Perceived control. Perceived control was measured with three instruments: Anxiety Control Questionnaire (ACQ), Spheres of Control-3 (SOC-3), and Rotter's Internal External Locus of Control Scale (LOC).

Rapee et al.'s (1996) Anxiety Control Questionnaire (ACQ) is a 30-item self-report questionnaire that measures perceived emotional control and perceived threat control (Appendix G). Items are measured on a 6-point Likert scale ranging from 0 (strongly disagree) to 5 (strongly agree). In its development, the ACQ was validated on undergraduate students and was found to have both convergent and discriminant validity. Additionally, the ACQ demonstrated test-rest reliability over a one month period (Rapee et al., 1996). In its creation, the authors described a two-factor structure of external events and internal emotional reactions. Raw scores based on summing item responses for each subscale were used in all analyses. Scores may range from 0-70 for the Internal subscale and from 0-80 for the External subscale.

Rotter's (1966) Internal External Locus of Control Scale (Appendix H) is a 29-item questionnaire that asks participants to choose between two contrasting statements regarding control. Higher scores indicate a more of an external locus of control and thus less of a personal sense of perceived control. Conversely, lower scores indicate a more of an internal locus of control and thus more of a personal sense of perceived control. Lange and Tiggemann (1981) suggested a two-factor structure of the Locus of Control scale (General and Political). Like the BAI these factors are not subscales but a part of the two factor structure of the measure. Raw scores based on summing item responses for each subscale were used in all analyses. Scores may range from 0 to 8 for the General subscale and from 0 to 5 for the Political subscale.

Paulhus' (1990) Spheres of Control-3 (SOC-3) scale (Appendix I) is a 30-item questionnaire that is rated on a 7-point Likert scale. This scale looks at the participants perceived personal, interpersonal, and sociopolitical control. The subscales of personal, interpersonal, and sociopolitical control have demonstrated concurrent validity with the Rotter's Locus of Scale ($r = -.37, -.28, -.50$, respectively) in that those that report more perceived control also report having more of a sense of internal locus of control. For undergraduates, the personal control subscale has the weakest internal consistency for the SOC with αs as low as .38. The other two subscales have better internal consistencies among undergraduate students ($\alpha = .67$-$.85$). Raw scores based on summing item responses for each subscale were used in all analyses. Scores may range from 10 to 70 for the Personal subscale, from 10 to 70 for the Interpersonal subscale, and from 10 to 70 for the Sociopolitical subscale.

Data Collection Procedures

Students accessed a link to the survey and first completed an online informed consent, and then a demographic form (Appendices J and C respectively). Once they completed the demographic form, participants filled out the six surveys, alternating measures of anxiety and perceived control. After completing the survey, the participant had the option to enter the drawing. To avoid duplicate entries from participants, the informed consent asked participants to provide their student ID number.

Analytic Procedures

The purpose of this study was to determine if relations between anxiety and perceived control were invariant across three cultural groups: African Americans, Caucasians, and Hispanic/Latinos. To assess invariance, a multi-group structural

equation modeling (MG-SEM) approach was used. Within this approach, the first step is to evaluate the measurement model (factor loadings, intercepts, and error variances). Once the invariance of the measurement model is established, the structural relations (factor variances, covariances, and means) may be evaluated for invariance.

Four levels of measurement invariance were evaluated: configural, metric, scalar, and strict. Configural invariance is demonstrated when the factor structure is the same across groups; here, factor loadings, intercepts, and errors are allowed to differ between groups. Metric invariance is demonstrated when the factor loadings are the same across groups; here, only intercepts and errors are allowed to differ. Scalar invariance is demonstrated when the factor intercepts are the same across groups; here only the errors are allowed to differ. Strict invariance is demonstrated when factor structure, loadings, intercepts, and errors are the same across groups.

Measurement Models

Configural invariance (Unconstrained Model). Because the measures of anxiety and perceived control had previously established factor structures that demonstrated invariance (Beck & Steer, 1993; Beck et al., 1988; Lange & Tiggeman, 1981; Lovibond & Lovibond, 1995; Rapee et al., 1996; Spielberger et al., 1980; Spittal, Siegert, McClure, & Walkey, 2002), models based on these factor structures were evaluated for invariance across groups. Subscales were initially loaded on to their respective measure factors (i.e., three factors each for anxiety and perceived control). Factor structures were then modified based on model fit criteria.

Metric invariance (Model 1). Once a configural model was established, then metric invariance was evaluated to determine if the factor loadings were invariant across

groups while allowing intercepts and errors to differ. Differences in model fits were evaluated to determine if constraining the factor loadings to be equal across groups significantly reduced model fit.

Scalar invariance (Model 2). Once metric invariance was established, the next level to be evaluated was scalar invariance which evaluates if the factor intercepts are equal while allowing errors to differ. Differences in model fits were evaluated to determine if constraining the factor intercepts to be equal across groups significantly reduced model fit.

Strict invariance (Model 3). Once scalar invariance was established, the final level of the measurement model evaluated was strict invariance which evaluated if the error variances were equal across groups.

Structural Models

Three models were evaluated to determine if the structural relations between anxiety and perceived control were invariant across the three groups: Model 4 (factor variances), Model 5 (factor covariances), and Model 6 (factor means). A similar process as described for the measurement model was used to evaluate the invariance of the parameters in each of the models.

Evaluating Model Fits

For this study's criteria of overall model fit, the following was used: (a) CFI $\geq$ .95 (Hu & Bentler, 1999), (b) RMSEA $\leq$ .07 (Steiger, 2007), and (c) SRMR $\leq$ .08 (Hu & Bentler, 1999). These fit indices were used because they are more robust to issues with sample size and nonnormal distributions compared to X^2. A decision about the invariance between models was based on changes in chi-square (ΔX^2) values with p-

values less than .05 and changes less than .01 in confirmatory fit index (ΔCFI) values (Cheung & Rensvold, 2002; Hu & Bentler, 1999; Satorra & Bentler, 1999). When making comparisons, ΔCFI is less susceptible to Type I errors compared to the ΔX^2 (French & Finch, 2011). In addition, in evaluating the measurement models, modification indices were examined to determine if specific observed variables should be loaded on different factors or removed from the models.

Chapter IV

Results

Preliminary Analysis

Excluded Observations. Initially, there were 401 observations. Because the focus of this study is on three specific groups (African Americans, Caucasians, and Hispanics/Latinos), observations that were missing group identification (n = 14), that identified as other/multi-racial (n = 18), selected that they would prefer not to respond (n = 3), or did not solely identify as one of the three specific groups of interest were deleted (n = 90). The number of observations was reduced to 276. Thirty-seven observations were repeat entries. Twenty-five participants repeated one additional time, one participant repeated two times, one participant repeated three times, and one participant repeated an additional seven times. The first, most complete submission of the repeated observations was kept for each participant.

Missing Data. The remaining observations (*N* = 239, 113 Hispanic/Latino, 51 African American, 75 Caucasian) were evaluated for missing data among the anxiety and perceived control item responses. Across the three groups, 29 (12.1%) participants were missing data (some or all item responses within and across measures). There was no significant difference in the proportion of participants with missing data across the three groups, χ^2 (2, N = 239) = .280, p > .05 (13.73% African American, 10.67% Hispanic/Latinos, 12.39% Caucasian). The difference in the proportion of those missing data between males and females was not statistically significant, χ^2 (2, N = 239) = 3.659, p > .05, (13.86% female, 2.70% male). The lack of significance may be due to the low

number of males in the sample. All analyses are based on participants with complete data, N = 210.

Data Screening

Tables 2a – 2c include descriptive information for all the measures by group. One assumption of structural equation modeling (SEM) is multivariate normality; therefore, the data was screened for multivariate outliers as well as violations of multivariate normality. Summary scores for each measure's subscales were calculated. Skew and kurtosis statistics have an acceptable range of -1 to 1. For African Americans multivariate skew and kurtosis for all variables were generally at acceptable levels; however some were slightly out of range (see Table 2a for descriptive statistics). For Caucasians, multivariate skew and kurtosis for almost all of the summary scores were at acceptable levels with a few slightly out of acceptable range (Table 2b). For Hispanic/Latinos, multivariate skew and kurtosis for all summary scores but one (BAI Somatic) were within acceptable levels (Table 2c).

Most of the measures had high internal consistencies (see Table 2a-2c). However, the LOC subscales (General and Political) demonstrated inadequate internal consistencies in African Americans (αs = .384, .542), Caucasians (αs = .486, .454), and Hispanic/Latinos (αs = .550, .546), which lead to the decision not to include this measure in the measurement model. Multivariate normality was assessed by group using Mardia's statistic and its critical ratio (Mardia, 1970; Mardia, 1983). Some groups violated the assumption of multivariate normality using a critical ratio cutoff of 3.0. This criteria was met only for the African American group (kurtosis = 9.829, c.r. = 2.104). The critical ratios for Caucasians (kurtosis = 11.676, c.r. = 3.085) and Hispanic/Latinos

(kurtosis = 9.430, 3.028) were slightly greater than three. Although the assumption of multivariate normality may be violated for two of the groups, the parameter estimates should still be accurate although their corresponding significant coefficients might be high (Kline, 1998). Also, SEM models based on maximum likelihood estimation tend to be more robust to kurtosis violations of multivariate normality as long as the critical ratio of the kurtosis is less than 8 (Kline, 2012).

Table 2a.

Descriptive Data and Reliability Estimates of Calculated Summary Scores

African Americans					
Summary Score	M	SD	Skew	Kurtosis	α
BAI Somatic	17.20	5.77	0.55	-1.01	0.88
BAI Subjective	15.16	4.87	0.35	-1.04	0.82
DASS Anxiety	12.09	4.38	0.47	-1.05	0.82
DASS Stress	13.84	4.37	0.07	-0.81	0.83
STAI State	40.82	11.98	-0.19	-1.16	0.92
STAI Trait	41.93	9.43	-0.30	-1.00	0.87
ACQ Internal	55.55	9.55	0.54	-0.59	0.79
ACQ External	65.55	9.02	0.49	-0.14	0.67
LOC General	4.50	1.68	0.36	-0.50	0.38
LOC Political	1.82	1.43	0.09	-1.28	0.54
SOC Personal	48.68	9.97	0.50	-0.61	0.86
SOC Interpersonal	46.41	8.75	0.70	-0.04	0.78
SOC Sociopolitical	39.41	7.80	0.21	0.82	0.70

Table 2b.

Descriptive Data and Reliability Estimates of Calculated Summary Scores

Caucasians					
Summary Score	M	SD	Skew	Kurtosis	A
BAI Somatic	16.76	5.56	1.04	0.00	0.87
BAI Subjective	15.19	5.23	1.02	0.30	0.87
DASS Anxiety	10.24	3.98	1.63	2.36	0.88
DASS Stress	12.97	4.17	0.68	0.44	0.85
STAI State	39.39	12.94	0.16	-0.91	0.94
STAI Trait	40.64	11.19	0.00	-0.86	0.93
ACQ Internal	55.01	10.10	0.39	0.05	0.83
ACQ External	66.81	10.76	-0.01	-0.55	0.83
LOC General	5.40	1.71	-0.38	0.30	0.49
LOC Political	1.82	1.31	0.30	-0.77	0.45
SOC Personal	52.10	9.29	-0.22	-0.64	0.84
SOC Interpersonal	47.40	8.03	0.21	-0.11	0.71
SOC Sociopolitical	38.57	8.41	0.35	0.06	0.73

Table 2c.

Descriptive Data and Reliability Estimates of Calculated Summary Scores

Hispanic/Latinos					
Summary Score	M	SD	Skew	Kurtosis	A
BAI Somatic	17.28	5.78	1.23	1.51	0.87
BAI Subjective	15.52	5.44	0.91	0.29	0.86
DASS Anxiety	10.75	3.72	0.82	-0.38	0.82
DASS Stress	13.12	4.21	0.53	-0.48	0.84
STAI State	39.93	11.97	0.14	-0.56	0.94
STAI Trait	41.21	11.29	0.36	0.05	0.93
ACQ Internal	56.21	10.38	-0.16	-0.52	0.83
ACQ External	66.59	9.95	-0.17	-0.19	0.76
LOC General	5.21	1.70	-0.42	0.30	0.55
LOC Political	1.94	1.42	0.22	-0.91	0.55
SOC Personal	53.97	8.24	-0.03	-0.67	0.78
SOC Interpersonal	48.94	8.85	0.08	0.14	0.74
SOC Sociopolitical	39.84	9.71	0.14	0.26	0.80

Structural Equation Models

Tables 3a-3c include bivariate correlations between the observed measures of anxiety and perceived control for each group. The correlations tend to be greater within anxiety and within perceived control than between the anxiety and perceived control, which supports separate factors for these two constructs. Within anxiety for some measures, the subscales tend to correlate more highly with each other than with subscales from other measures. For example in African Americans, Caucasians, and Hispanic/Latinos, the BAI Somatic correlates more highly with the BAI Subjective subscale ($r = .865/.844/.894$, $ps < .05$) than with the DASS Anxiety ($r = .605/.539/.619$, $ps < .05$). The same is true for perceived control; the ACQ Internal correlates more highly with the ACQ External subscale ($r = .553/.714/.730$, $ps < .05$) than with the SOC Personal subscale ($r = .444/.561/.576$, $ps < .05$).

This suggests in at least some cases, the subscales are likely to load onto separate factors for their own measures. Exceptions may be the LOC General, LOC Political, and SOC Sociopolitical. Table 3 illustrates the SOC Sociopolitical Control's strongest correlations across groups are with the LOC Political ($rs = .463 - .661$, $p < .01$) compared to its low and mostly not significant correlations with the other SOC subscales of Personal Control are ($rs = -.222 - .189$, $p > .05$) and Interpersonal Control ($-.168 - .129$, $p > .05$; $.204$, $P < .05$). This suggests that political control might be too domain specific leading it to be another construct separate from general perceived control. This pattern is true for all three groups.

In addition, similar to previous research that found the ACQ to be a better predictor of DASS Anxiety than the LOC (Rapee et al., 1996), this study found the same

using these measures subscales. Across all groups, the DASS Anxiety subscale was more highly correlated with the ACQ Internal (rs = -.49/-0.61/-0.50, ps < .01) and the ACQ External (rs = -.56/-.48/-.50ps < .01) subscales than the either of the LOC subscales, which were generally statistically insignificant.

In contrast to the literature, Norton (2007) found that between the DASS subscales African Americans had the strongest correlations (rs = .93, .92, .97), followed by Hispanic/Latinos (rs = .79, .85, .84) and Caucasians (rs = .71, .72, .80), the current study found a different order. Hispanics had the strongest correlations between the DASS Anxiety and the DASS Stress (r = .759, p < .01), followed by Caucasians (r = .755, p < .01), and African Americans (r = .660, p < .01).

Table 3a.

Correlations between Observed Variables – African Americans

	Factor	1	2	3	4	5	6	7	8	9	10	11	12	13
1.	BAI Somatic	-												
2.	BAI Subjective	.865**	-											
3.	DASS Anxiety	.605**	.646**	-										
4.	DASS Stress	.428**	.472**	.660**	-									
5.	STAI Trait	.346*	.387**	.486**	.580**	-								
6.	STAI State	.391**	.461**	.429**	.440**	.820**	-							
7.	ACQ Internal	-.463**	-.470**	-.492**	-.350*	-.540**	-.555**	-						
8.	ACQ External	-.497**	-.593**	-.564**	-.482**	-.534**	-.478**	.553**	-					
9.	LOC General	-.182	-.198	-.247	-.316*	-.283	-.086	.177	.269	-				
10.	LOC Political	-.063	.018	.103	-.205	-.023	.044	-.062	-.087	-.010	-			
11.	Personal Control	-.418**	-.390**	-.483**	-.365*	-.395**	-.361*	.444**	.541**	.423**	-.222	-		
12.	Interpersonal Control	-.449**	-.416**	-.557**	-.458**	-.517**	-.475**	.624**	.574**	.398**	-.168	.829**	-	
13.	Socio-Political Control	-.005	.053	-.086	-.269	-.269	-.128	.211	.131	.181	.483**	.085	.188	-

Note. *. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

Table 3b.

Correlations between Observed Variables - Caucasians

	Factor	1	2	3	4	5	6	7	8	9	10	11	12	13
1.	BAI Somatic	-												
2.	BAI Subjective	.844**	-											
3.	DASS Anxiety	.539**	.582**	-										
4.	DASS Stress	.499**	.576**	.755**	-									
5.	STAI Trait	.338**	.464**	.551**	.663**	-								
6.	STAI State	.256*	.348**	.447**	.570**	.840**	-							
7.	ACQ Internal	-.399**	-.468**	-.613**	-.623**	-.691**	-.616*,	-						
8.	ACQ External	-.225	-.271*	-.479**	-.505**	-.681**	-.495*,	.714**	-					
9.	LOC General	-.070	-.145	-.097	-.196	-.392**	-.324*,	.401**	.455**	-				
10.	LOC Political	-.016	-.004	-.113	-.112	-.079	-.143	.132	.323**	.168	-			
11.	Personal Control	-.085	-.181	-.365**	-.301*	-.629**	-.615*,	.561**	.598**	.512**	.189	-		

12.	Interpersonal Control	-.091	-.130	-.215	-.266*	-.597**	-.489**	.579**	.605**	.470**	.129	.724**	-	
13.	Socio-Political Control	-.006	-.084	-.072	-.124	-.175	-.181	.091	.267*	.256*	.661**	.240	.219	-

Note. *. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

Table 3c.

Correlations between Observed Variables - Hispanic/Latinos

	Factor	1	2	3	4	5	6	7	8	9	10	11	12	13
1.	BAI Somatic	-												
2.	BAI Subjective	.894**	-											
3.	DASS Anxiety	.619**	.663**	-										
4.	DASS Stress	.565**	.647**	.759**	-									
5.	STAI Trait	.497**	.586**	.652**	.797**	-								
6.	STAI State	.479**	.578**	.563**	.697**	.849**	-							
7.	ACQ Internal	-.451**	-.463**	-.596**	-.699**	-.694**	-.597**	-						
8.	ACQ External	-.294**	-.347**	-.498**	-.593**	-.625**	-.534**	.730*	-					
9.	LOC General	-.137	-.153	-.245*	-.286**	-.276**	-.215*	.260*	.287**	-				
10.	LOC Political	-.156	-.153	-.113	-.187	-.151	-.145	.210	.205*	.090	-			
11.	Personal Control	-.265**	-.344**	-.565**	-.568**	-.661**	-.628**	.576*	.602**	.465**	.119	-		
12.	Interpersonal Control	-.397**	-.513**	-.561**	-.676**	-.741**	-.681**	.693*	.726**	.288**	.204*	.684**	-	
13.	Socio-Political Control	-.336**	-.308**	-.244*	-.308**	-.296**	-.244*	.364*	.264**	.111	.570**	.152	.356**	

Note. *. Correlation is significant at the 0.05 level (2-tailed). **. Correlation is significant at the 0.01 level (2-tailed).

Measurement Models

The factor structure for anxiety and perceived control were first analyzed separately, and then combined to evaluate measurement invariance across groups.

Anxiety Model. An unconstrained three factor anxiety model was evaluated first. The three factors were BAI, DASS, and STAI with the observed scale scores for each

measure (BAI Somatic, BAI Subjective, DASS Anxiety, DASS Stress, STAI State, and STAI Trait) loading on to their respective latent factors and the factors correlating with each other.

This unconstrained three factor model (i.e., all parameters allowed to differ across groups) fit the data well (χ^2 (20) = 26.33, CFI = .993, RMSEA = .039, SRMR = .047).

Perceived control. A similar process was conducted with perceived control starting with an established factor structure based on each measures subscales loading on to a latent factor for each measure (Rapee et al., 1996; Spittal, Siegert, McClure, & Walkey, 2002; Lange & Tiggeman, 1981). However, due to poor model fit (χ^2 (33) = 117.75, CFI = .856, RMSEA = .111, SRMR = .107), mostly due to poor internal consistencies of the LOC, an alternative factor structure was evaluated. The factors that were evaluated in this alternate two factor perceived control model were: ACQ and SOC with the four remaining observed summary scores of ACQ- Control over Internal Events, ACQ- Control over External Events, SOC-Personal Control, and SOC-Interpersonal Control. This alternate unconstrained model of perceived control model demonstrated good model fit (χ^2 (4) = 3.19, CFI = 1.0, RMSEA = .00, SRMR = .031).

Full Measurement Model. The full measurement model combined the three factor anxiety and the two factor perceived control models. The three levels of measurement invariance were evaluated: metric, scalar, and strict. Metric invariance (Model 1) was evaluated by constraining the factor loadings to be the same across groups; scalar invariance (Model 2) by also constraining the factor intercepts to be the same across groups; and strict invariance (Model 3) by constraining the error variances to be the same across groups.

Table 4 includes the fit statistics for the unconstrained and three constrained models. Model 3 (strict invariance) fits the data well (see Table 4), is not significantly different from the less constrained models (ΔX^2) and is the most parsimonious model. While some of the SRMR values for the combined model iterations were greater than .05, Hu and Bentler (1990) suggest that less than .08 as an acceptable cutoff value. Model 3 demonstrated strict invariance by constraining the measurement loadings, intercepts, and residuals. Figure 1 shows the final measurement model.

Table 4.

Goodness of Fit Indicators of Combined Measurement Model (N = 210)

Model	χ^2	DF	χ^2/DF	$\Delta\chi^2$	ΔDF	p ($\Delta\chi^2$)	RMSEA	CFI	ΔCFI	SRMR
Unconstrained	100.63	77	1.31	---	---	---	.038	.986	---	.040
Model 1	110.63	89	1.24	10.01	12	.616	.034	.987	.001	.059
Model 2	124.03	99	1.25	13.40	10	.202	.035	.985	.002	.059
Model 3	146.04	115	1.27	22.00	16	.143	.036	.981	.004	.061

Note. RMSEA root mean square root of approximation, CFI comparative fit index, SRMR standardized root mean square residual; Model 1 = metric invariance, Model 2 = scalar invariance, Model 3 = strict invariance; ΔCFI values represent the absolute value of the change

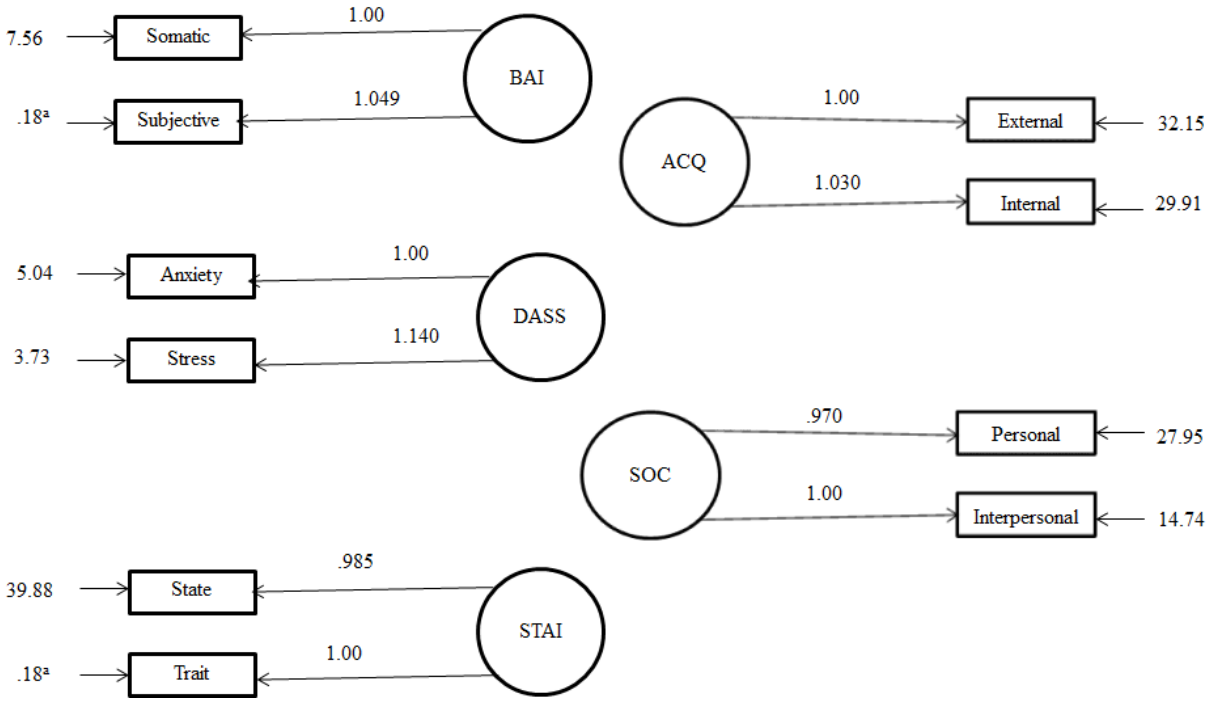

Figure 1. Full Measurement Model. All factor were allowed to correlate freely with each, however the paths are not shown to simplify the figure. Loadings (unstandardized regression weights) set at 1.00 were the reference variables; all estimated loadings were significant at $p < .001$. [a] These error variances were not significant $p > .05$; all other were significant at $p < .001$.

Structural Models

Because measurement invariance was established, a series of structural models were evaluated to determine if the relationship between anxiety and perceived control was the same for all three groups and if there were mean differences between groups in levels of anxiety and perceived control. Three models were analyzed for structural invariance: variances (Model 4), covariances (Model 5), and means (Model 6). The first structural model (Model 4) tested structural invariance by constraining the factor variances to be the same across groups. The second structural model (Model 5) tested structural invariance by also constraining the factor covariances to be the same across groups. The third structural model (Model 6) tested structural invariance by next

constraining the factor means to be the same across groups. Table 5 includes the fit statistics for the three structural models.

Table 5.

Goodness of Fit Indicators of Combined Measurement Model (N = 210)

Model	χ^2	DF	χ^2/DF	$\Delta\chi^2$	ΔDF	p ($\Delta\chi^2$)	RMSEA	CFI	ΔCFI	SRMR
Model 4	152.85	125	1.22	6.81	10	.743	.033	.983	.002	.067
Model 5	198.23	145	1.37	45.38	20	.001	.042	.967	.016	.096
Model 6	214.93	155	1.39	16.70	10	.081	.043	.963	.004	.095

Note. Model 4 Δχ2 , ΔDF, and ΔCFI values are based on change from the Model 3 (Table 4) RMSEA root mean square root of approximation, CFI comparative fit index, SRMR standardized root mean square residual; Model 4 = factor variances, Model 5 = factor covariances, Model 6 = factor means; ΔCFI values represent the absolute value of the change

Model 4 (variances the same, but covariances and means different across groups) was determined to be the best fitting model because it fits the data well (see Table 5), is not significantly different from the less constrained models (ΔX^2) and is the most parsimonious model. Model 5, which constrained factor covariances exceeded both the ΔX^2 significance cutoff of .05 and the ΔCFI threshold .01 making it significantly different from its predecessor. Figure 2 shows the final structural model.

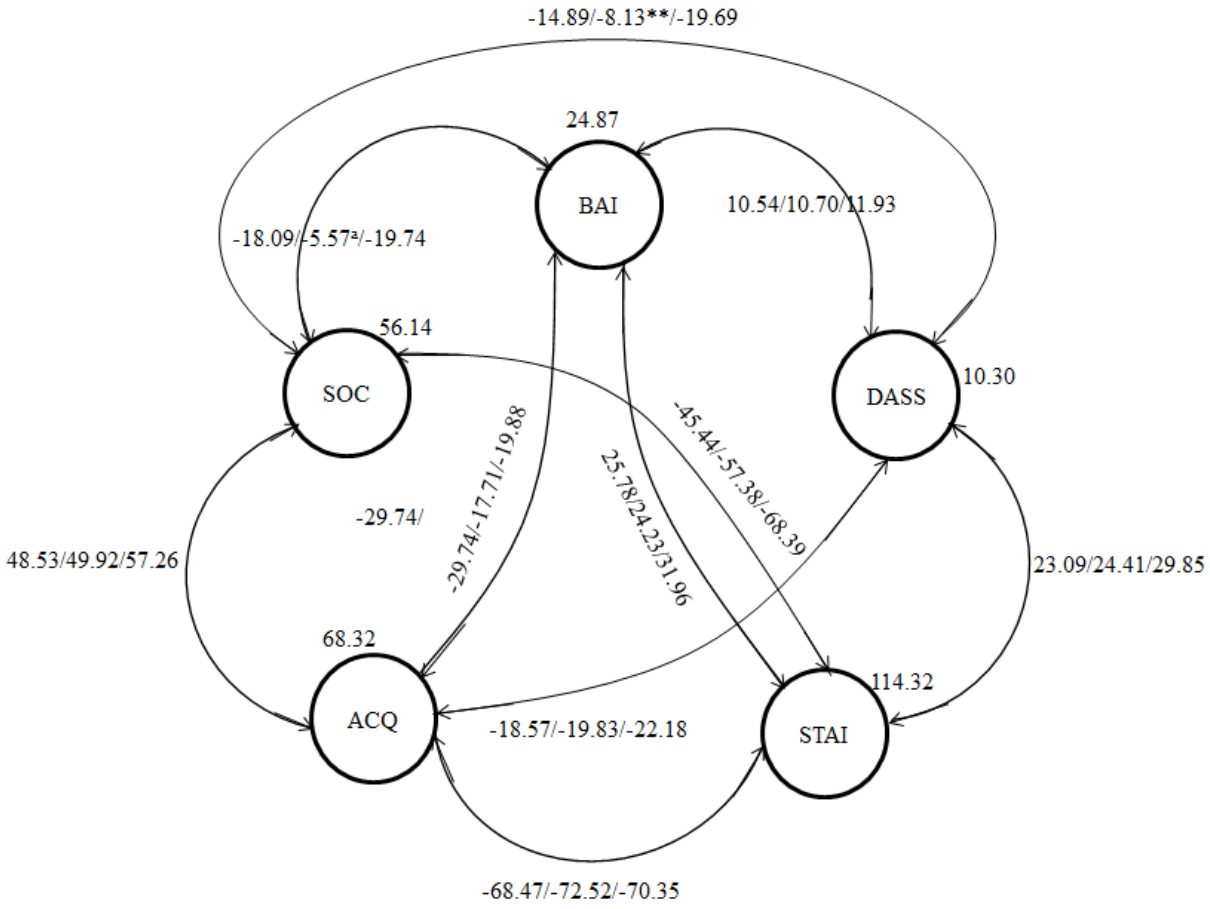

Figure 2. Full Structural Model. All values are unstandardized parameter estimates. Values next to the factor are the variances, which were significant at $p < .001$. For covariances, values reported are for African Americans, Caucasians, and Hispanic/Latinos, respectively. Covariances marked with ** were significant at $p < .01$, others marked with an [a] were not significant ($p > .05$). All other covariances were significant at $p < .001$.

Factor Correlations. Table 6 shows the factor correlations by group. Hispanic/Latinos generally had the strongest correlations between anxiety measures. The difference between Hispanic/Latinos and the other groups appeared to be greatest in the relationship between DASS and STAI. To determine if the relations between DASS and STAI were statistically higher among Hispanic/Latinos than the other groups, a model which constrained the covariances for the African American and Caucasians groups to be equal and allowed the Hispanic group to differ was compared to a model that constrained the covariances for all groups between the DASS and the STAI to be equal. Model fit

suggested that the model that constrained all group covariances to be equal was significantly worse ($\Delta\chi^2$= 7.822, $p < .05$), therefore Hispanics did have a statistically significant higher correlation than the other groups.

Hispanic/Latinos also had the strongest correlation between the two perceived control factors ($r = .925$, $p < .001$) followed by Caucasians ($r = .806$, $p < .001$) and African Americans ($r = .784$, $p < .001$). The model testing procedure described above was used to test if Hispanic/Latinos had a statistically significant higher correlation. Model fit suggested that Hispanic/Latinos did not have a significantly higher correlation than the other groups ($\Delta\chi^2$= 3.83, $p > .05$).

Among the correlations between the anxiety and perceived control measures, there was not a consistent pattern in terms of which groups had strong relations versus the others. The relation between BAI and ACQ did not differ across groups. Constraining all the groups to be equal was not a worse fitting model than allowing the covariance of African Americans to differ ($\Delta\chi^2 = 3.62$, $p > .05$). For the DASS and the SOC, Hispanic/Latinos had the strongest correlations ($r = -.819$, $p < .001$) followed by African Americans ($r = -.619$, $p < .001$) and Caucasians ($r = -.338$, $p < .001$). Analysis revealed the Hispanic/Latinos did have a significantly higher correlation than the other groups ($\Delta\chi^2 = 14.08$, $p < .05$) and that Caucasians had a significantly lower correlation than the other groups ($\Delta\chi^2 = 13.43$, $p < .05$).

Table 6.

Correlations between Latent Factors Across Groups

Factors	Group		
	African Americans	Caucasians	Hispanic/Latinos
Anxiety			
BAI & DASS	.659***	.668***	.746***
BAI & STAI	.484***	.454***	.599***
DASS& STAI	.673***	.712***	.870***
Perceived Control			
ACQ & SOC	.784***	.806***	.925***
Anxiety and Perceived Control			
BAI & ACQ	-.722***	-.430***	-.482***
BAI & SOC	-.484***	-.149	-.528***
DASS & ACQ	-.700***	-.748***	-.836***
DASS & SOC	-.619***	-.338**	-.819***
STAI & ACQ	-.775***	-.821***	-.796***
STAI & SOC	-.567***	-.716***	-.854***

* $p < .05$, ** $p < .01$, *** $p < .001$

Factor Means. The models were evaluated for differences in the latent means between groups. Based on Dimitrov (2006), this can be done by setting one of the groups to zero and observing the differences in the other groups' latent means. Results indicated that each group has a different mean level of anxiety for each latent factor and a different mean level of perceived control for each latent factor (see Table 7).

Overall, Caucasians have lower anxiety than Hispanic/Latinos. African Americans have higher levels of anxiety than Caucasians and Hispanic/Latinos for the BAI (see Table 7). Conversely, for the DASS and STAI, Hispanic/Latinos had a highest mean level of anxiety, followed by Caucasians, and then African Americans.

For perceived control, Caucasians tend to report less perceived control than Hispanic/Latinos. African Americans also overall reported less perceived control than both Caucasians and Hispanic/Latinos as measured by the SOC. However using the ACQ, African Americans reported the highest mean level of perceived control followed by Hispanic/Latinos and then Caucasians.

Table 7.

Factor Means (SD) by Group

Factor	Group		
	African Americans	Caucasians	Hispanic/Latinos[a]
BAI	0.883 (.636)	-0.266 (.554)	0
DASS	-0.333 (.914)	-0.312 (.798)	0
STAI	-0.827 (1.655)	-0.524 (1.454)	0
ACQ	0.74 (1.99)	-0.568 (1.737)	0
SOC	-3.485 (1.484)	-1.664 (1.294)	0

[a]The Hispanic/Latino group is the reference group so factor means are set to 0.

Chapter V

Discussion

The purpose of this study was to determine if the measurement of anxiety and perceived control and the relations between these constructs differ across three cultural groups: African Americans, Caucasians, and Hispanic/Latinos. The hypotheses were that (1) these measures would be invariant across groups and (2) that the structural relationship between anxiety and perceived control would not be invariant across groups. These hypotheses were supported by the results of this study because the data showed that the anxiety and perceived control, as measured in this study, were invariant across groups. Because these measures demonstrated strict invariance across groups, it appears that these measures are measuring the same constructs in each group. Additionally, the data revealed that these groups differed in the way these constructs relate to each other and in their means for each latent factor.

These results are consistent with previous literature that suggested that these measures would be invariant across groups (Norton, 2005; Norton, 2007; Whisman et al., 2012), and that the structural relationships would differ (Norton, 2007).

Cross-Cultural Similarities/Differences

Anxiety. There are several cross-cultural similarities and differences in the measurement of anxiety and in the relations between anxiety constructs across groups.

Measurement. The anxiety measures in the current study used have been extensively researched. In the development of a scale, subscales for a particular measure tend to relate to each other through the measuring of an unobserved trait. It would follow that these subscales would load together on similar latent factor. Each anxiety measure

has had at least one factor structure tested based on its original subscales. This study used the original factor structures to create an anxiety measurement model and these subscales easily fit into a neat three factor structure. Previously these measures had never been evaluated together in one measurement model. The three groups were able constrain the same factor structure, loadings, intercepts, and error variances to be equal in the measurement model.

Relations between constructs across groups (i.e., factor correlations). The relations between the anxiety factors seem to differ. The BAI is heavily loaded with somatic and panic symptoms of anxiety and its subscales correlate lower with the other measures of anxiety (DASS and STAI) than with itself. The DASS has both somatic and panic symptoms of anxiety but also includes some cognitive items such as worry. The STAI also includes some somatic symptoms but lists more dispositional and affect states such as feeling frightened, satisfied, nervous, and at ease. The differences in the items could be causing the differences in the relationships between these measures of anxiety. There are different expressions of anxiety: cognitive processes (i.e. worrying, measured by the STAI and the DASS), somatic (i.e. feeling tense, measured by the STAI and BAI), and physiological (i.e. breathing difficulty, measured by the BAI and the DASS), which guide the perspective of the scale construction. The BAI is a measure of somatic and panic symptoms of anxiety, which is meant to be distinct from depression. The DASS is also a measure that means to discriminant from depression. Because of this, these measures have more physiological anxiety-related symptoms such as breathing difficulty and hand trembling. The STAI is a measure of state and trait anxiety and is not necessarily directly trying to discriminant between depression or other constructs. Items

on the STAI are meant to evoke either an anxiety present or an anxiety absence response. Thus, the latent factors BAI and DASS correlated more strongly across groups than the BAI and STAI factors. Additionally, the DASS and STAI correlated more strongly across groups than the BAI and STAI. The DASS shares similar items with both the BAI and STAI, however the later share less similarities.

Results from the current study indicated a difference from the literature that found that between the DASS subscales African Americans had the strongest correlations, followed by Hispanic/Latinos and Caucasians (Norton, 2007). The current study found a different order. Hispanics had the strongest correlations between the DASS Anxiety and the DASS Stress, followed by Caucasians, and African Americans. This difference from the literature could be due to the differences in group sizes because the African American group was the smallest.

Levels of anxiety across groups (means). The mean levels of anxiety differed across groups. Previous studies have found that Mexican students report higher levels of anxiety than American students (Baloğlu et al., 2007). Similarly, using the Hispanic/Latino group in place of the Mexican students and Caucasians in place of the American students, the current study found that that using the factor mean of the DASS or the STAI, Hispanic/Latinos had the highest mean level of anxiety followed by Caucasians, and then African Americans. Future research should further classify participants by country of origin to see if similar results can be found. Another study found that European Americans reported higher levels of anxiety than African Americans (Chapman, Williams et al., 2009). Using the same measure as the Chapman, Williams et al. (2009) study, African Americans would have the highest level of somatic anxiety and

subjective panic and worry (BAI), followed by Hispanic/Latinos, and then Caucasians. In the current study, depending on which anxiety measure was used lead to a different result.

Perceived Control. There are also several cross-cultural similarities and differences in the measurement of perceived control and in the relations between the perceived control constructs across groups.

Measurement. There has been limited research as a whole on the construct of perceived control compared to anxiety. One of the measures used in this study (LOC) did not make it to the full measurement model due to poor model fit, inadequate internal consistencies, and low correlations with related subscales. In addition, one subscale of another measure (SOC Sociopolitical) also did not make it to the full measurement model due to poor model fit and low correlations with its related subscales.

The political related subscales (LOC Political and SOC Sociopolitical) were more strongly correlated with each other than with their respective measure subscales. This combined with their poor regression weights for their measure factor suggested that political control might be a separate from and possibly unrelated to construct of general perceived control. Another possible reason for the LOC's inability to be included might be related to the way the LOC is structured; there are only two choices for each item limiting the variability in the responses.

Relations between constructs across groups. The relations between perceived control factors differed across groups. Overall, the ACQ subscales correlated moderately with the SOC subscales across groups. The ACQ measures control over emotional reactions and external threats while the SOC measures perceived control over three

different dimensions: personal, interpersonal, and sociopolitical. Both scales share similar control items that deal with control over personal, interpersonal situations that could be either an opportunity to control one's internal reaction in a situation or something external to the self. Generally, African Americans had the lowest the correlations between the ACQ Subscales and the SOC Personal subscale. There were observable differences in the relationship between the ACQ External and the SOC Interpersonal across groups. Hispanic/Latinos had the highest correlations between these subscales, followed by Caucasians, with African Americans having the lowest correlation. Perhaps, interpersonal control is a more significant component of Hispanic/Latino culture as opposed to African Americans leadings to the lower correlation.

Levels of perceived control across groups (means). As measured by the summary subscale SOC Personal, Hispanic/Latinos reported higher levels of perceived control than Caucasians and African Americans. In accordance with the literature that suggest European Americans reported less perceived control than African Americans (Chapman, Kertz et al., 2009), African Americans reported more perceived control than Caucasians as measure by the ACQ. Conversely, African Americans overall reported less perceived control than both Caucasians and Hispanic/Latinos on the SOC factor. Caucasians also reported a lower mean level of perceived control than Hispanic/Latinos on both perceived control factors.

As previously mentioned, different scales measuring the same construct can lead to different results. The differences caused by these different guiding perspectives are more apparent when examining the correlations across measures between two distinct

constructs such as anxiety and perceived control. Some measures of anxiety are more strongly correlated with certain measures of perceived control.

Perceived Control vs. Anxiety. Similar to previous literature (Rapee et al., 1996), the current study found that the ACQ was a better predictor of DASS Anxiety than the LOC. In this study, the LOC demonstrated poor internal consistency. These poor internal consistencies could be due to small number of items on each subscale; the General control subscale has eight items and the Political control has five items. Perhaps, this scale might need a revaluation its factor structure or the way that it is scored because many items are left unscored.

In African Americans, the relationship between the BAI, a highly somatic and panic symptom measure, had a very high correlation with the ACQ, a measure of control over internal reactions and external events. Perhaps, somatic symptoms are a better indicator of anxiety in African Americans compared to other cultural groups. Chapman, Kertz et al. (2009) found that in African Americans, psychological distress was a better predictor of worry than perceived control, as measured by the ACQ. Perhaps in this study, in African Americans the better predictor of somatic anxiety was perceived control over internal and external events as measured by the ACQ compared to personal and interpersonal control.

In Caucasians, the strongest relationship between the two latent constructs was between the STAI, a more cognitive measure of anxiety, and the ACQ. Perhaps, for Caucasians, cognitive symptoms such as worry and changes in disposition (STAI) are more indicative of anxiety and that control over internal reactions and over external events (ACQ) is the best indicator of perceived control leading to the strong correlation

between the two. For Hispanic/Latinos, although literature suggests the internalization of anxiety might translate into somatic symptoms (Varela & Hensley-Maloney, 2009), the strongest correlations between latent factors were for the STAI and SOC, a measure of personal and interpersonal control. In Hispanic culture, where family is central, being able to have control over personal and interpersonal interactions could be necessary for avoiding anxiety. The differences in the items and the theoretical perspective guiding the measures could be the reason for the differences in the relationships between these measures.

Limitations

There were several limitations to this study. One limitation was that the sample primarily female. Also, there were more Hispanic/Latino participants than in the other groups. While the disproportion in racial groups or gender was not significant to whether or not data was missing, these disproportions may have had an effect nonetheless. Future research should generate diverse and equally distributed samples. Another limitation was the limited sample size. Bentler and Chou (1987) suggest that there be 10 to 1 ratio of respondents to parameters being estimated. If however, multivariate assumptions are violated then this ratio increases to 15 respondents to every 1 parameter being estimated. The final selected combined measurement model estimated 70 parameters, and two of the groups violated multivariate normality assumptions. Utilizing Bentler and Chou's (1987) guidelines of a 15 to 1 ratio, a much greater sample size than the current study ($N = 210$) would be needed ($N \geq 1050$). Future studies should attempt to generate larger samples. A second limitation was that participated were college students. From the literature, we know that college populations of minorities are different from the general population

groups such as African Americans and Hispanics are more likely to be underrepresented in highly selective colleges compared to Caucasians even when controlling for income (Reardon, Baker, & Klasik, 2012). These disparities in enrollment are even more apparent at the lower and middle income levels as families from lower socioeconomic statuses are far less represented in highly selective schools. In 2008, of the 1,327,000 students enrolled in Texas' degree granting institutions, 48.8% were White, 28.4% were Hispanic, and 12.8% were Black (U.S. Census Bureau, 2012). This underrepresentation of minorities and the individuals from lower income families may give an inaccurate view of the attitudes in each cultural group. Future research should look at testing these findings among a general non-college population.

Conclusion

Establishing invariance is a critical component of cross-cultural research. This study sought to add to the literature by testing the measurement and structural invariance of these perceived control and anxiety measures among three different cultural groups: African Americans, Caucasians, and Hispanic/Latinos. These measures demonstrated strict invariance and additionally factor variances were invariant across the three cultural groups. More research is needed to investigate the invariance of these measures in larger samples and in a general non-college population to determine if these results are replicable.

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Appendix A

Recruitment Script

Appendix A

Recruitment Script

My name is Alexandria Posada, a graduate student from the Department of Educational Psychology at University of Houston. I would like to invite you to participate in my research study that is looking at perceived control and anxiety. You may participate if you are over 18 years of age. Please do not participate if you are not yet 18 years old.

As a participant, you will be asked to complete an online survey that will take approximately 40-60 minutes to complete.

There are minimal anticipated risks associated with participation in this project similar to the stresses expected in this study are comparable to those experienced in everyday life.

By participating in this study you will be eligible to be entered into a drawing for a $25 VISA gift card. You may also be eligible to receive 1.0 hours of SONA credit, if your class accepts this form of extra credit. You will receive full credit after completing the entire survey. Per different classes, there may also be other forms of extra credit to participate in.

I would also like to inform you that there are a limited number of spots available.

Are there any questions at this time? If you have questions later, please contact me at amheysquierdo@uh.edu.

Appendix B

Recruitment Flyer

Appendix B

UNIVERSITY of HOUSTON
A CARNEGIE-DESIGNATED TIER ONE PUBLIC RESEARCH UNIVERSITY

Volunteers Needed for Research Study

Participants are needed for the research study:

"Cross-Cultural Variations in Perceived Control and Anxiety"

Description of Project: You will be asked questions regarding your level of perceived control across various domains and levels of anxiety. There is minimal risk involved meaning no more than in your daily life. As a participant, you will be asked to complete an online survey that will take approximately 30-45 minutes of your time.

To Participate: You must be at least 18 years old and currently enrolled at the University of Houston. All majors are welcome to participate.

Incentives: As an incentive for fully completing the study you can receive 1 hour of SONA credit as well as be entered into a drawing to win a $25 VISA gift card. If you want to receive SONA credit you need to make sure you access the survey through the SONA website. Please be advised that there are a limited number of spots available and spots are likely to fill up quickly.

This research is conducted under the direction of Dr. Tammy Tolar, Educational Psychology Department, and has been reviewed and approved by the University of Houston's Institutional Review Board. If you have any questions you can contact the principle investigator of the study, Alexandria Posada, amheysquierdo@uh.edu. This project has been reviewed by the University of Houston Committee for the Protection of Human Subjects (713) 743-9204.

SURVEY LINK: https://epsyuh.co1.qualtrics.com/SE/?SID=SV_56Vfv34w3YyUE7P

Appendix C

Demographic Survey

Appendix C

Demographic Survey

1. What is your gender?
    a. Female
    b. Male
2. What is your age?
    a. (Please enter number)
3. What is your race/ethnicity?
    a. Asian/Pacific Islander
    b. Black/African-American
    c. Caucasian
    d. Hispanic
    e. Native American/Alaska Native
    f. Other/Multi-Racial (Please enter an 'other' value for this selection.)
    g. Prefer Not to Respond
4. What is your major of study?
    a. (Provides drop down list of all majors offered by the University of Houston.)
    b. (Also includes the option of other/Graduate Student)

Appendix D

Beck Anxiety Inventory

Appendix D

Beck Anxiety Inventory

Beck Anxiety Inventory - Instructions: Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past month, including today, by selecting the in the corresponding choice space in the column next to each symptom.

	NOT AT ALL	MILDY, but it did not bother me much	MODERATELY; it wasn't pleasant at times.	SEVERELY; it bothered me a lot.
Numbness or tingling				
Feeling hot				
Wobbliness in legs				
Unable to relax				
Fear or worst happening				
Dizzy or lightheaded				
Heart pounding/racing				
Unsteady				
Terrified				
Nervous				
Feeling of choking				
Hands trembling				
Shaky				
Fear of losing control				
Difficulty breathing				
Fear of dying				
Scared				
Indigestion or discomfort in abdomen				
Faint				
Face Flushed				
Sweating (not due to heat)				

Appendix E

Depression Anxiety Stress Scale (DASS-21)

Appendix E

Depression Anxiety Stress Scale (DASS-21)

DASS-21 - Instructions: Please read each statement and select the corresponding choice space in the column next to each symptom, which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement. The rating scale is as follows: Did not apply to me at all – NEVER; Applied to me to some degree, or some of the time – SOMETIMES; Applied to me to a considerable degree, or a good part of time – OFTEN; Applied to me very much, or most of the time - ALMOST ALWAYS

1. I found it hard to wind down
2. I was aware of dryness of my mouth
3. I couldn't seem to experience any positive feeling at all
4. I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)
5. I found it difficult to work up the initiative to do things
6. I tended to over-react to situations
7. I experienced trembling (eg, in the hands)
8. I felt that I was using a lot of nervous energy
9. I was worried about situations in which I might panic and make a fool of myself
10. I felt that I had nothing to look forward to
11. I found myself getting agitated

12. I found it difficult to relax
13. I felt down-hearted and blue
14. I was intolerant of anything that kept me from getting on with what I was doing
15. I felt I was close to panic
16. I was unable to become enthusiastic about anything
17. I felt I wasn't worth much as a person
18. I felt that I was rather touchy
19. I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)
20. I felt scared without any good reason
21. I felt that life was meaningless

Appendix F

State-Trait Inventory

Appendix F

State-Trait Inventory

STAI - Instructions: A number of statements that people use to describe themselves are given below. Read each statement and then select the appropriate choice to indicate how you generally feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
I feel calm				
I am secure				
I am tense				
I feel strained				
I feel at ease				
I feel upset				
I am presently worrying over possible misfortunes				
I feel satisfied				
I feel frightened				
I feel comfortable				
I feel self-confident				
I feel nervous				
I am jittery				
I feel indecisive				
I am relaxed				
I feel content				
I am worried				
I feel confused				
I feel steady				
I feel pleasant				

STAI - Instructions: A number of statements that people use to describe themselves are given below. Read each statement and then select the appropriate choice to indicate how you feel right now, that is, this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
I feel pleasant				
I feel nervous and restless				
I feel satisfied with myself				
I wish I could be as happy as others seem to be				
I feel like a failure				
I feel rested				
I am "calm, cool, and collected"				
I feel that difficulties are piling up so that I cannot overcome them				
I worry too much over something that really doesn't matter				
I am happy				
I have disturbing thoughts				
I lack self-confidence				
I feel secure				
I make decisions easily				
I feel inadequate				
I am content				
Some unimportant thought runs through my mind and bothers me				
I take disappointments so keenly that I can't put them out of my mind				
I am a steady person				
I get in a state of tension or turmoil as I think over my recent concerns and interests				

Appendix G

Anxiety Control Questionnaire

Appendix G

Anxiety Control Questionnaire

Instructions: Listed below are a number of statements describing a set of beliefs. Please read each statement carefully and, on the 0-5 scale given, indicate how much you think each statement is typical of you. 0 means completely disagree and 5 means completely agree.

1. I am usually able to avoid threat quite easily.
2. How well I cope with difficult situations depends on whether I have outside help.
3. When I am put under stress, I am likely to lose control.
4. I can usually stop my anxiety from showing.
5. When I am frightened by something, there is generally nothing I can do.
6. My emotions seem to have a life of their own.
7. There is little I can do to influence people's judgments of me.
8. Whether I can successfully escape a frightening situation is always a matter of chance with me.
9. I often shake uncontrollably.
10. I can usually put worrisome thoughts out of my mind easily.
11. When I am in a stressful situation, I am able to stop myself from breathing too hard.
12. I can usually influence the degree to which a situation is potentially threatening to me.
13. I am able to control my level of anxiety.
14. There is little I can do to change frightening events.
15. The extent to which a difficult situation resolves itself has nothing to do with my actions.
16. If something is going to hurt me, it will happen no matter what I do.
17. I can usually relax when I want.
18. When I am under stress, I am not always sure how I will react.
19. I can usually make sure people like me if I work at it.
20. Most events that make me anxious are outside my control.
21. I always know exactly how I will react to difficult situations.
22. I am unconcerned if I become anxious in a difficult situation, because I am confident in my ability to cope with my symptoms.
23. What people think of me is largely outside my control.
24. I usually find it hard to deal with difficult problems.
25. When I hear that someone has a serious illness, I worry that I am next.
26. When I am anxious, I find it difficult to focus on anything other than my anxiety.
27. I am able to cope as effectively with unexpected anxiety as I am with anxiety that I expect to occur.
28. I sometimes think, "Why even bother to try to cope with my anxiety when nothing I do seems to affect how frequently or intensely I experience it?".
29. I often have the ability to get along with "difficult" people.
30. I will avoid conflict due to my inability to successfully resolve it.

Appendix H

Rotter's Locus of Control Scale

Appendix H

Rotter's Locus of Control Scale

For each question select the statement that you agree with the most

1. a. Children get into trouble because their patents punish them too much.
   b. The trouble with most children nowadays is that their parents are too easy with them.
2. a. Many of the unhappy things in people's lives are partly due to bad luck.
   b. People's misfortunes result from the mistakes they make.
3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.
   b. There will always be wars, no matter how hard people try to prevent them.
4. a. In the long run people get the respect they deserve in this world
   b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries
5. a. The idea that teachers are unfair to students is nonsense.
   b. Most students don't realize the extent to which their grades are influenced by accidental happenings.
6. a. Without the right breaks one cannot be an effective leader.
   b. Capable people who fail to become leaders have not taken advantage of their opportunities.
7. a. No matter how hard you try some people just don't like you.
   b. People who can't get others to like them don't understand how to get along with others.
8. a. Heredity plays the major role in determining one's personality
   b. It is one's experiences in life which determine what they're like.
9. a. I have often found that what is going to happen will happen.
   b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10. a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.

b. Many times exam questions tend to be so unrelated to course work that studying in really useless.

11. a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.

b. Getting a good job depends mainly on being in the right place at the right time.

12. a. The average citizen can have an influence in government decisions.

b. This world is run by the few people in power, and there is not much the little guy can do about it.

13. a. When I make plans, I am almost certain that I can make them work.

b. It is not always wise to plan too far ahead because many things turn out to- be a matter of good or bad fortune anyhow.

14. a. There are certain people who are just no good.

b. There is some good in everybody.

15. a. In my case getting what I want has little or nothing to do with luck.

b. Many times we might just as well decide what to do by flipping a coin.

16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.

b. Getting people to do the right thing depends upon ability. Luck has little or nothing to do with it.

17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.

b. By taking an active part in political and social affairs the people can control world events.

18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.

b. There really is no such thing as "luck."

19. a. One should always be willing to admit mistakes.

b. It is usually best to cover up one's mistakes.

20. a. It is hard to know whether or not a person really likes you.

b. How many friends you have depends upon how nice a person you are.

21. a. In the long run the bad things that happen to us are balanced by the good ones.

b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

Appendix I

Spheres of Control Scale-3

Appendix I

Spheres of Control Scale-3

Instructions: Select a number from 1 (Disagree) to 7 (Agree)to indicate how much you agree with each statement.

1. I can usually achieve what I want if I work hard for it.
2. In my personal relationships, the other person usually has more control than I do.
3. By taking an active part in political and social affairs, we, the people, can influence world events.
4. Once I make plans, I am almost certain to make them work.
5. I have no trouble making and keeping friends.
6. The average citizen can have an influence on government decisions.
7. I prefer games involving some luck over games requiring pure skill.
8. I'm not good at guiding the course of a conversation with several others.
9. It is difficult for us to have much control over the things politicians do in office.
10. I can learn almost anything if I set my mind to it.
11. I can usually develop a personal relationship with someone I find appealing.
12. Bad economic conditions are caused by world events that are beyond our control.
13. My major accomplishments are entirely due to my hard work and ability.
14. I can usually steer a conversation toward the topics I want to talk about.
15. With enough effort we can wipe out political corruption.
16. I usually do not set goals because I have a hard time following through on them.
17. When I need assistance with something, I often find it difficult to get others to help.
18. One of the major reasons we have wars is because people don't take enough interest in politics.
19. Bad luck has sometimes prevented me from achieving things.
20. If there's someone I want to meet, I can usually arrange it.
21. There is nothing we, as consumers, can do to keep the cost of living from going higher.

Appendix J

Informed Consent

Appendix J

Informed Consent

UNIVERSITY OF HOUSTON
CONSENT TO PARTICIPATE IN RESEARCH

PROJECT TITLE: Cross-Cultural Variations in Perceived Control and Anxiety
You are being invited to take part in a Master's thesis research project conducted by Alexandria Posada supervised by Dr. Tammy Tolar from the Educational Psychology Department at the University of Houston.

NON-PARTICIPATION STATEMENT

Taking part in the research project is voluntary and you may refuse to take part or withdraw at any time without penalty or loss of benefits to which you are otherwise entitled. You may also refuse to answer any research-related questions that make you uncomfortable. A decision to participate or not or to withdraw your participation will have no effect on your academic standing.

PURPOSE OF THE STUDY

The purpose of this study is to examine the relationship between perceived control and anxiety among different ethnicities. Data collection will last for approximately 3 months. The participant should expect to spend about 30-45 minutes completing the survey.

PROCEDURES

An online questionnaire will be administered that asks the participant to give their opinion on a variety of statements. The participant will be asked about their self-perceptions on a variety of topics including, but not limited to, their emotional control, locus of control, and any anxiety symptoms experienced.

CONFIDENTIALITY

Your identity will be held in confidence. Every effort will be made to maintain the confidentiality of your participation in this project. The survey website will keep track of a number that identifies your computer. However, the survey tool will keep this identifying information anonymous and thus the researchers will not have access to this information.

RISKS/DISCOMFORTS

There minimal risks associated with participation in this project since some of the questions ask about private emotional states. However, the stresses expected in this study are comparable to those experienced in everyday life. If you are upset, please contact the University of Houston's Counseling and Psychological Services at (713) 743-5454.

BENEFITS

While you will not directly benefit, your participation will help the investigators better understand this area of research.

ALTERNATIVES

Participation in this project is voluntary and the only alternative to this project is non-participation.

INCENTIVES/REMUNERATION

You may be eligible to receive 1.0 hours of SONA credit if your class accepts this form of extra credit. You will receive full credit after completing the entire survey. Per different classes, there may also be other forms of extra credit to participate in. Additionally, participants will be eligible to enter into a drawing for a $25 VISA gift card.

PUBLICATION STATEMENT

The results of this study may be published in scientific journals, professional publications, or educational presentations; however, no individual subject will be identified.

SUBJECT RIGHTS

1. I understand that informed consent is required of all persons participating in this project.
2. I have been told that I may refuse to participate or to stop my participation in this project at any time before or during the project. I may also refuse to answer any question.
3. Any risks and/or discomforts have been explained to me, as have any potential benefits.
4. I understand the protections in place to safeguard any personally identifiable information related to my participation.
5. I understand that, if I have any questions, I may contact Alexandria Posada at amheysquierdo@uh.edu. I may also contact, Dr. Tammy Tolar, faculty sponsor, at 713-743-4945.
6. **Any questions regarding my rights as a research subject may be addressed to the University of Houston Committee for the Protection of Human Subjects (713-743-9204). All research projects that are carried out by Investigators at the University of Houston are governed be requirements of the University and the federal government**.

Please select one of the two options below (I give my consent OR I do not give my consent) and for either selection, please provide your student ID number. By selecting I give my consent, you are acknowledging the information on this consent form and consenting to participating in this research study.

I give my consent
I do NOT give my consent.
Enter student ID number.